

# Iowa Air Quality Index Exceedance Trends 1999-2005



*Iowa DNR  
Ambient Air Monitoring Group*

# What is the Air Quality Index (AQI)?

The AQI is number used to report daily air quality. The AQI is computed from real-time air monitoring data and was created to inform of the public of health effects that can occur within a few hours or days after breathing polluted air. EPA has developed the AQI for five pollutants regulated by the Clean Air Act: ground-level ozone (O<sub>3</sub>), particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>), carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), and nitrogen dioxide (NO<sub>2</sub>).

## AQI Exceedances

When air pollutant concentrations exceed an AQI of 100, EPA classifies the air quality as “Unhealthy for Sensitive Groups”. Pollutant concentrations corresponding to an AQI of 101 are listed below:

<b>Ozone: 85 ppb</b>	<b>(8hr average)</b>
<b>PM2.5: 40.5 ug/m3</b>	<b>(24hr average)</b>
<b>PM10: 155 ug/m3</b>	<b>(24hr average)</b>
<b>SO2: 145 ppb</b>	<b>(24hr average)</b>
<b>CO: 9.5 ppm</b>	<b>(8hr average)</b>

Values over these levels are AQI exceedances. Additional AQI categories are given in the following table.

# Understanding the AQI

Air Quality Index (AQI) Values	Levels of Health Concern	Colors
<i>When the AQI is in this range:</i>	<i>...air quality conditions are:</i>	<i>...as symbolized by this color:</i>
0 to 50	Good	Green
51 to 100	Moderate	Yellow
101 to 150	Unhealthy for Sensitive Groups	Orange
151 to 200	Unhealthy	Red
201 to 300	Very Unhealthy	Purple
301 to 500	Hazardous	Maroon

# What is Particulate Matter?

The term “particulate matter” (PM) includes both solid particles and liquid droplets (excluding water droplets) that are found in outdoor air. Particulate matter may be emitted directly into the air or can form from pollutants that react in the atmosphere. Small particles tend to pose the greatest health concern because they can be inhaled into and accumulate in the respiratory system.

Particles of less than 10 microns in diameter are referred to as PM<sub>10</sub>.

Particles of less than 2.5 microns in diameter are referred to as PM<sub>2.5</sub>.

Sources of PM<sub>2.5</sub> include all types of combustion (motor vehicles, power plants, wood burning, etc.) and some industrial processes. Sources of particles that are smaller than PM<sub>10</sub> but larger than PM<sub>2.5</sub> include crushing or grinding operations, and dust from paved or unpaved roads.

## How is Particulate Matter Measured ?

Iowa operates two distinct types of PM samplers. One type collects the aerosol by drawing ambient air through a filter over a 24-hour period. The filters are then returned to an analytical laboratory where they are weighed. This process provides accurate concentrations, but the data is not available to the public until the analytical work is complete, usually about a month after the sampling date. In order to provide more timely information, Iowa operates continuous samplers that measure PM10 and PM2.5 in real-time.

Some continuous PM10 samplers used in Iowa have been designated by EPA as equivalent to filter based methods. However, there are currently no continuous PM2.5 samplers designated by EPA as equivalent to filter based methods. EPA encourages use of continuous PM2.5 monitors for reporting the AQI when the data can be shown to be well correlated with the data from filter samplers. This report does not include data from continuous PM2.5 samplers or non-equivalent PM10 samplers.

# 1999 AQI Exceedances

(Air Quality Index and Color Code Indicated in Final Column)

Monitor Type	Site Location	Site Name	Exceedance Date	Conc.	Units	AQI
Ozone	Clinton	Rainbow Park	5/30/1999	92	ppb	119
Ozone	North Davenport	Scott County Park	5/30/1999	91	ppb	116
Ozone	North Davenport	Argo	5/30/1999	89	ppb	111
Ozone	South Cedar Rapids	Kirkwood College	9/2/1999	90	ppb	114
Ozone	Clinton	Rainbow Park	9/3/1999	91	ppb	116
Ozone	North Davenport	Scott County Park	9/3/1999	86	ppb	104
Ozone	North Davenport	Scott County Park	9/4/1999	91	ppb	116
Ozone	Clinton	Rainbow Park	9/4/1999	90	ppb	114
Ozone	Cedar Rapids	Kirkwood College	9/4/1999	90	ppb	114
Ozone	North Davenport	Argo	9/4/1999	85	ppb	101
Ozone	Lacey-Keosauqua	Lacey-Keosauqua	9/4/1999	85	ppb	101
PM2.5	Central Davenport	Jefferson Elementary	9/3/1999	46.7	ug/m3	113
PM2.5	Central Davenport	Adams Elementary	9/3/1999	46.7	ug/m3	113
PM2.5	Muscatine	Greenwood Cemetary	9/3/1999	43.4	ug/m3	107
PM2.5	Clinton	Rainbow Park	9/3/1999	42.9	ug/m3	106
PM10	Buffalo	Linwood Mining	5/3/1999	182	ug/m3	114
PM10	Buffalo	Linwood Mining	5/4/1999	176	ug/m3	111
PM10	Mason City	17th and Washington	10/22/1999	272	ug/m3	159
SO2	Muscatine	Musser Park	12/1/1999	148	ppb	103

## 2000 AQI Exceedances

Monitor Type	Site Location	Site Name	Exceedance Date	Conc.	Units	AQI
Ozone	North Cedar Rapids	Coggon	4/30/2000	90	ppb	114
Ozone	Clinton	Rainbow Park	6/8/2000	85	ppb	101
Ozone	Warren County	Lake Ahquabi	6/8/2000	86	ppb	104
Ozone	North Davenport	Scott County Park	8/31/2000	86	ppb	104
PM2.5	Central Davenport	Jefferson Elementary	8/30/2000	41.9	ug/m3	104
PM2.5	Central Davenport	Jefferson Elementary	10/23/2000	42.2	ug/m3	104
PM10	Davenport	Black Hawk Foundry	3/27/2000	180	ug/m3	113
PM10	Buffalo	Linwood Mining	4/5/2000	193	ug/m3	120
PM10	Mason City	17th and Washington	4/5/2000	187	ug/m3	117

## 2001 AQI Exceedances

Monitor Type	Site Location	Site Name	Exceedance Date	Conc.	Units	AQI
Ozone	Waverly	Airport	6/28/2001	87.0	ppb	106
PM2.5	Central Davenport	Jefferson Elementary	1/22/2001	52.2	ug/m3	124
PM2.5	Central Davenport	Adams Elementary	1/22/2001	50.3	ug/m3	120
PM2.5	Muscatine	Garfield Elementary	1/22/2001	52.5	ug/m3	125
PM2.5	Iowa City	Hoover Elementary	1/22/2001	49.8	ug/m3	119
PM2.5	Cedar Rapids	Army Reserve	1/22/2001	49.0	ug/m3	118
PM2.5	Cedar Rapids	Monroe Elementary	1/22/2001	48.4	ug/m3	117
PM2.5	Clinton	Rainbow Park	1/22/2001	49.4	ug/m3	119
PM2.5	Waterloo	Grout Museum	1/22/2001	55.0	ug/m3	130
PM2.5	Cedar Rapids	Army Reserve	3/30/2001	41.0	ug/m3	102
PM2.5	Muscatine	Garfield Elementary	4/4/2001	52.5	ug/m3	125
PM2.5	Central Davenport	Jefferson Elementary	8/8/2001	40.7	ug/m3	101

## 2002 AQI Exceedances

Monitor Type	Site Location	Site Name	Exceedance Date	Conc.	Units	AQI
Ozone	Clinton	Rainbow Park	6/23/2002	94	ppb	124
Ozone	North Davenport	Argo	6/23/2002	94	ppb	124
Ozone	Davenport	Scott County Park	6/23/2002	94	ppb	124
Ozone	Pisgah	Pisgah	6/24/2002	86.0	ppb	104
Ozone	North Davenport	Argo	9/7/2002	93	ppb	122
Ozone	Davenport	Scott County Park	9/7/2002	102	ppb	145
Ozone	Southeast Iowa	Lake Sugema	9/7/2002	94.0	ppb	124
PM10	Mason City	17th and Washington	2/26/2002	168	ug/m3	107
PM10	Buffalo	Linwood Mining	3/24/2002	169	ug/m3	108

## 2003 AQI Exceedances

Monitor Type	Site Location	Site Name	Exceedance Date	Conc.	Units	AQI
PM2.5	Cedar Rapids	Army Reserve	3/18/2003	48.7	ug/m3	117
PM2.5	Des Moines	Polk County Health	3/18/2003	45.9	ug/m3	112
PM2.5	Central Davenport	Jefferson Elementary	3/18/2003	46.8	ug/m3	113
PM2.5	Muscatine	Garfield Elementary	4/18/2003	43.9	ug/m3	108
PM2.5	Cedar Rapids	Army Reserve	9/10/2003	44	ug/m3	108
Ozone	Southeast Iowa	Lake Sugema	4/11/2003	85	ppb	101

## 2004 AQI Exceedances

Monitor Type	Site Location	Site Name	Exceedance Date	Conc.	Units	AQI
PM10	Mason City	17th and Washington	1/14/2004	162	ug/m3	104
PM10	Emmetsburg	Iowa Lakes College	4/18/2004	158	ug/m3	102
PM10	Council Bluffs	Mid American Energy	4/18/2004	170	ug/m3	108
PM10	Buffalo	Linwood Mining	9/20/2004	171	ug/m3	109
PM2.5	Mason City	10th and Monroe	2/18/2004	42.3	ug/m3	105
PM2.5	Muscatine	Garfield Elementary	7/2/2004	59.3	ug/m3	138
PM2.5	Clinton	Rainbow Park	12/29/2004	42.3	ug/m3	105

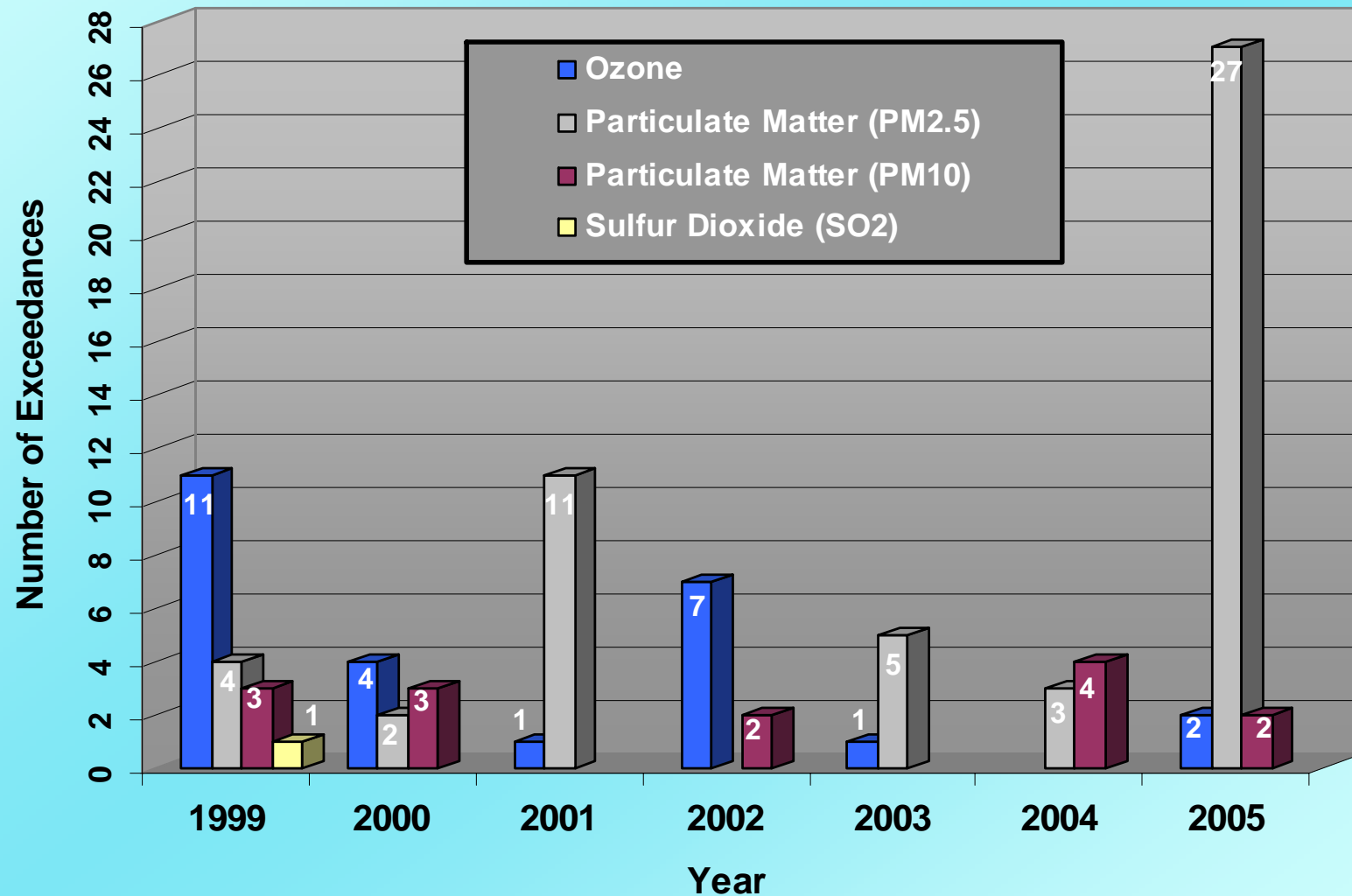
## 2005 AQI Exceedances

Monitor Type	Site Location	Site Name	Exceedance Date	Conc.	Units	AQI
PM2.5	Des Moines	Polk County Health	1/30/2005	42.9	ug/m3	106
PM2.5	Waterloo	Grout Museum	1/31/2005	53.2	ug/m3	126
PM2.5	Clarion	Clarion-CAFO	1/31/2005	51.7	ug/m3	123
PM2.5	Council Bluffs	Franklin Elementary	1/31/2005	51.7	ug/m3	123
PM2.5	Des Moines	Cornell Elementary	1/31/2005	48.8	ug/m3	117
PM2.5	Clive	Indian Hills Junior High	1/31/2005	48.5	ug/m3	117
PM2.5	Iowa City	Hoover Elementary	1/31/2005	47.6	ug/m3	115
PM2.5	Sioux City	Lowell Elementary	1/31/2005	47.2	ug/m3	114
PM2.5	Des Moines	Polk County Health	1/31/2005	47	ug/m3	114
PM2.5	Cedar Rapids	Army Reserve	1/31/2005	45	ug/m3	110
PM2.5	Montgomery County	Viking Lake State Park	1/31/2005	43.7	ug/m3	107
PM2.5	Emmetsburg	Iowa Lakes College	1/31/2005	40.6	ug/m3	101
PM2.5	Cedar Rapids	Army Reserve	2/1/2005	48.3	ug/m3	116
PM2.5	Des Moines	Polk County Health	2/1/2005	45.9	ug/m3	112
PM2.5	Des Moines	Polk County Health	2/2/2005	44	ug/m3	108

## 2005 AQI Exceedances (cont'd)

Monitor Type	Site Location	Site Name	Exceedance Date	Conc.	Units	AQI
PM2.5	Clinton	Rainbow Park	2/3/2005	41.2	ug/m3	102
PM2.5	Iowa City	Hoover Elementary	2/3/2005	41.0	ug/m3	102
PM2.5	Davenport	Black Hawk Foundry	6/27/2005	41.7	ug/m3	103
PM2.5	Iowa City	Hoover Elementary	8/2/2005	41.2	ug/m3	102
PM2.5	Cedar Rapids	Army Reserve	8/2/2005	40.8	ug/m3	102
PM2.5	Clinton	Rainbow Park	8/2/2005	45.3	ug/m3	110
PM2.5	Muscatine	Garfield Elementary	8/2/2005	43.6	ug/m3	107
PM2.5	Davenport	Black Hawk Foundry	8/2/2005	50.5	ug/m3	121
PM2.5	Central Davenport	Adams Elementary	8/2/2005	44.5	ug/m3	109
PM2.5	Central Davenport	Jefferson Elementary	8/2/2005	44	ug/m3	108
PM2.5	Central Davenport	Jefferson Elementary	9/11/2005	40.5	ug/m3	101
PM2.5	Davenport	Black Hawk Foundry	9/13/2005	41.2	ug/m3	102
PM10	Mason City	17th and Washington	1/13/2005	163	ug/m3	105
PM10	Buffalo	Linwood Mining	8/2/2005	164	ug/m3	105
Ozone	Clinton	Rainbow Park	6/24/2005	85	ppb	101
Ozone	Clinton	Rainbow Park	7/11/2005	87	ppb	106

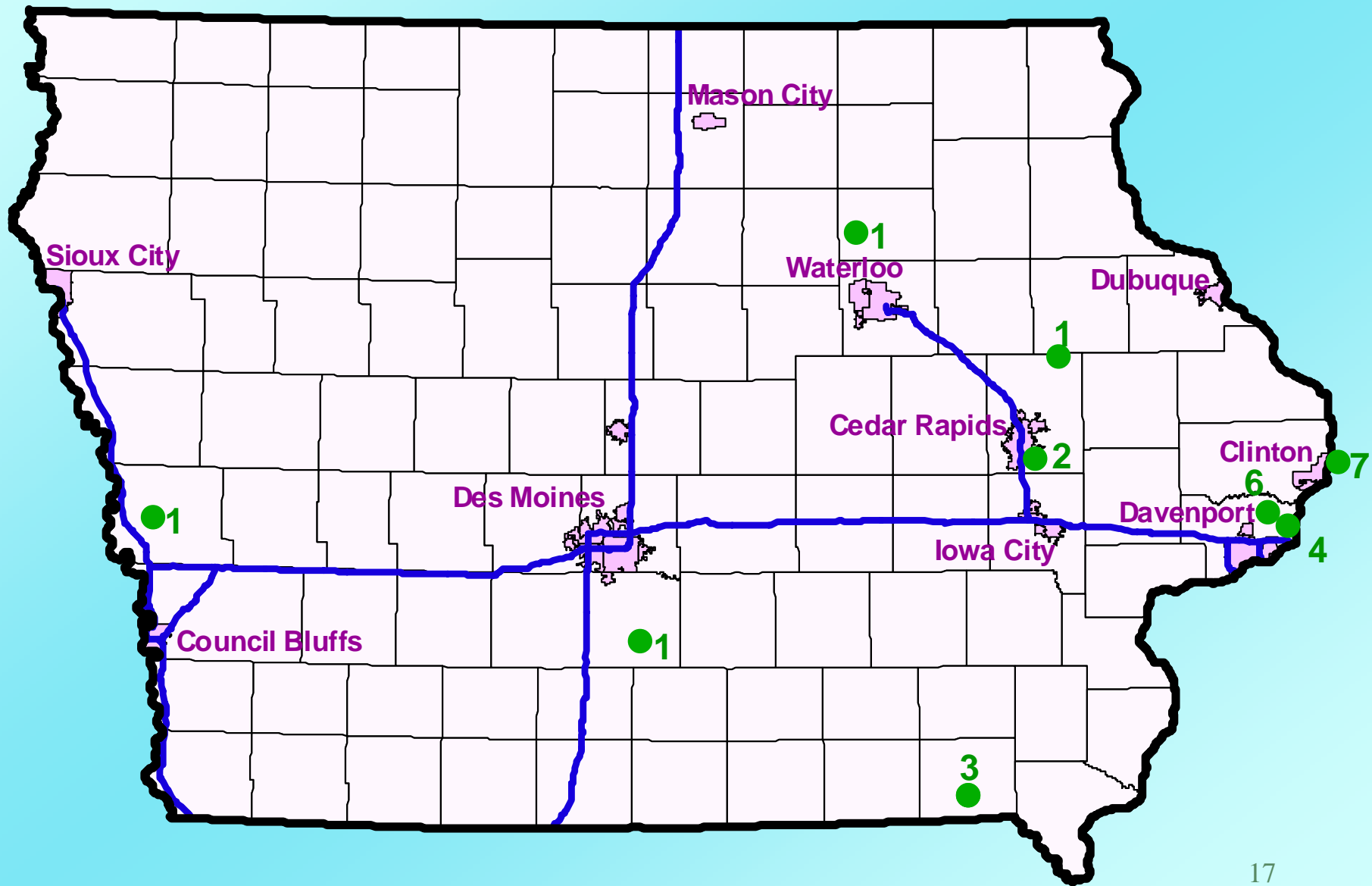
# Exceedances of EPA Health Thresholds in Iowa 1999-2005



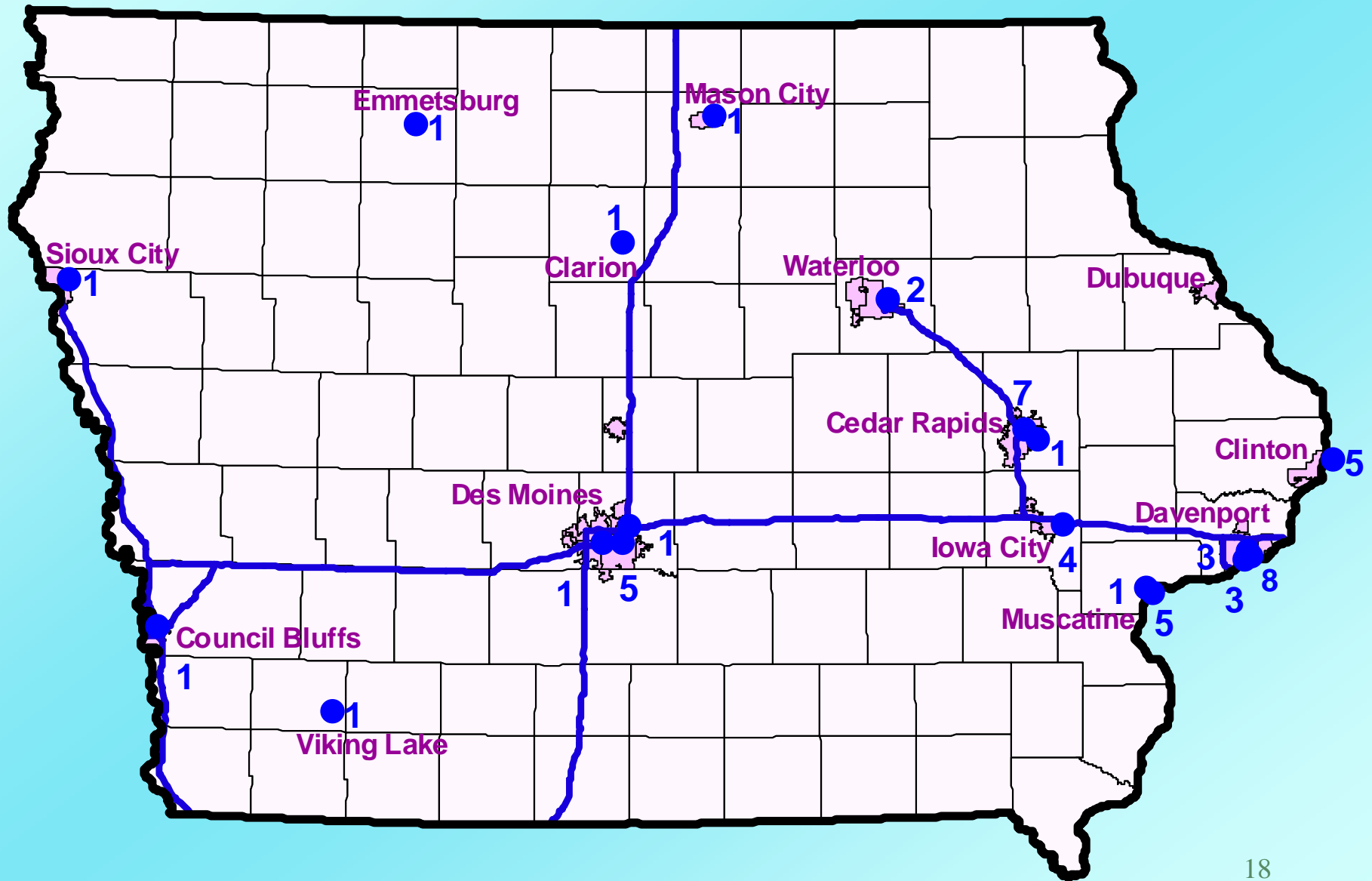
## AQI Exceedances by Pollutant 1999-2005

Pollutant	1999	2000	2001	2002	2003	2004	2005
Ozone	11	4	1	7	1		2
Particulate Matter (PM2.5)	4	2	11		5	3	27
Particulate Matter (PM10)	3	3		2		4	2
Sulfur Dioxide (SO2)	1						
CO							
Annual Totals	19	9	12	9	6	7	31

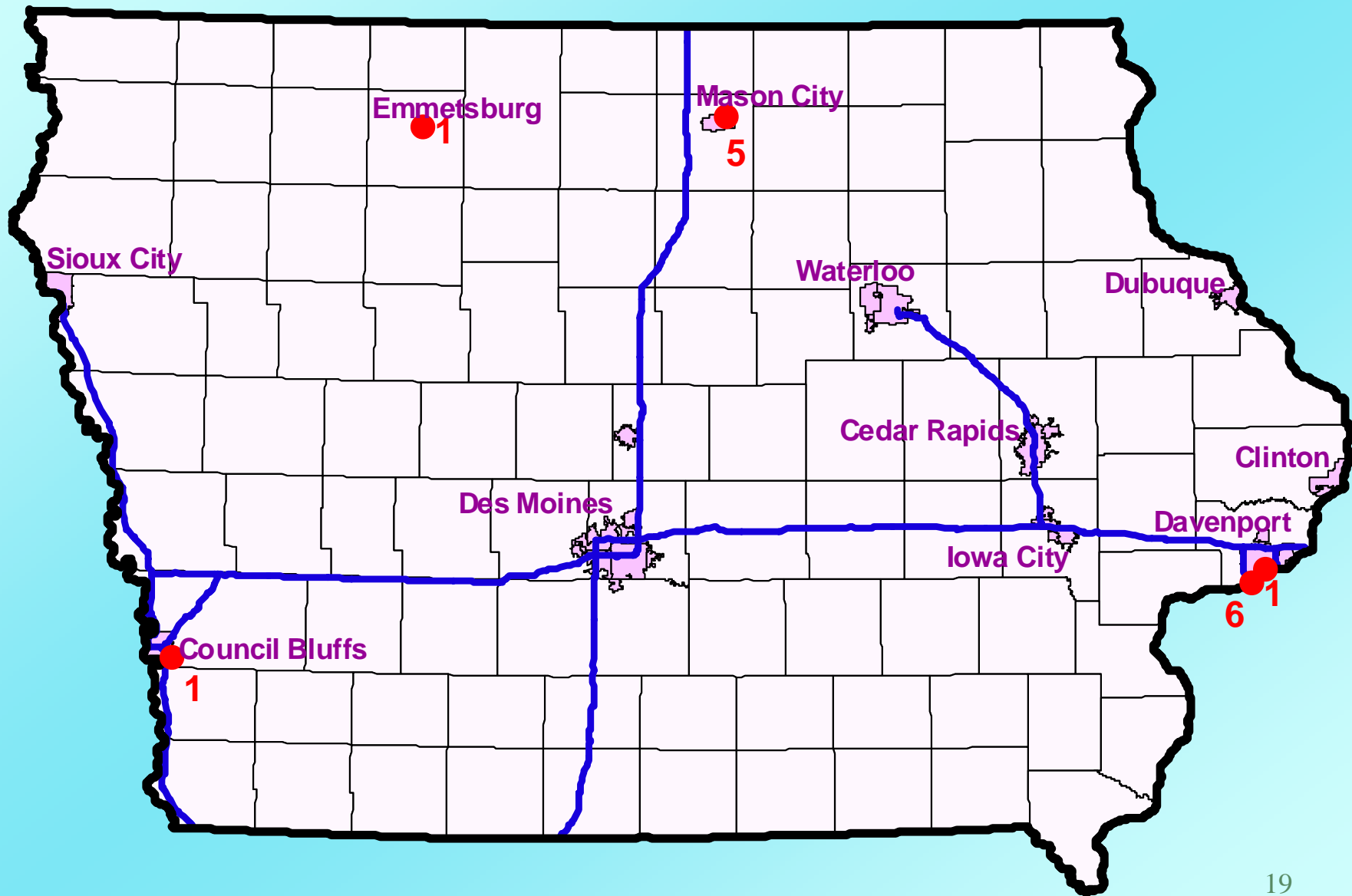
# Ozone AQI Exceedances in Iowa 1999-2005



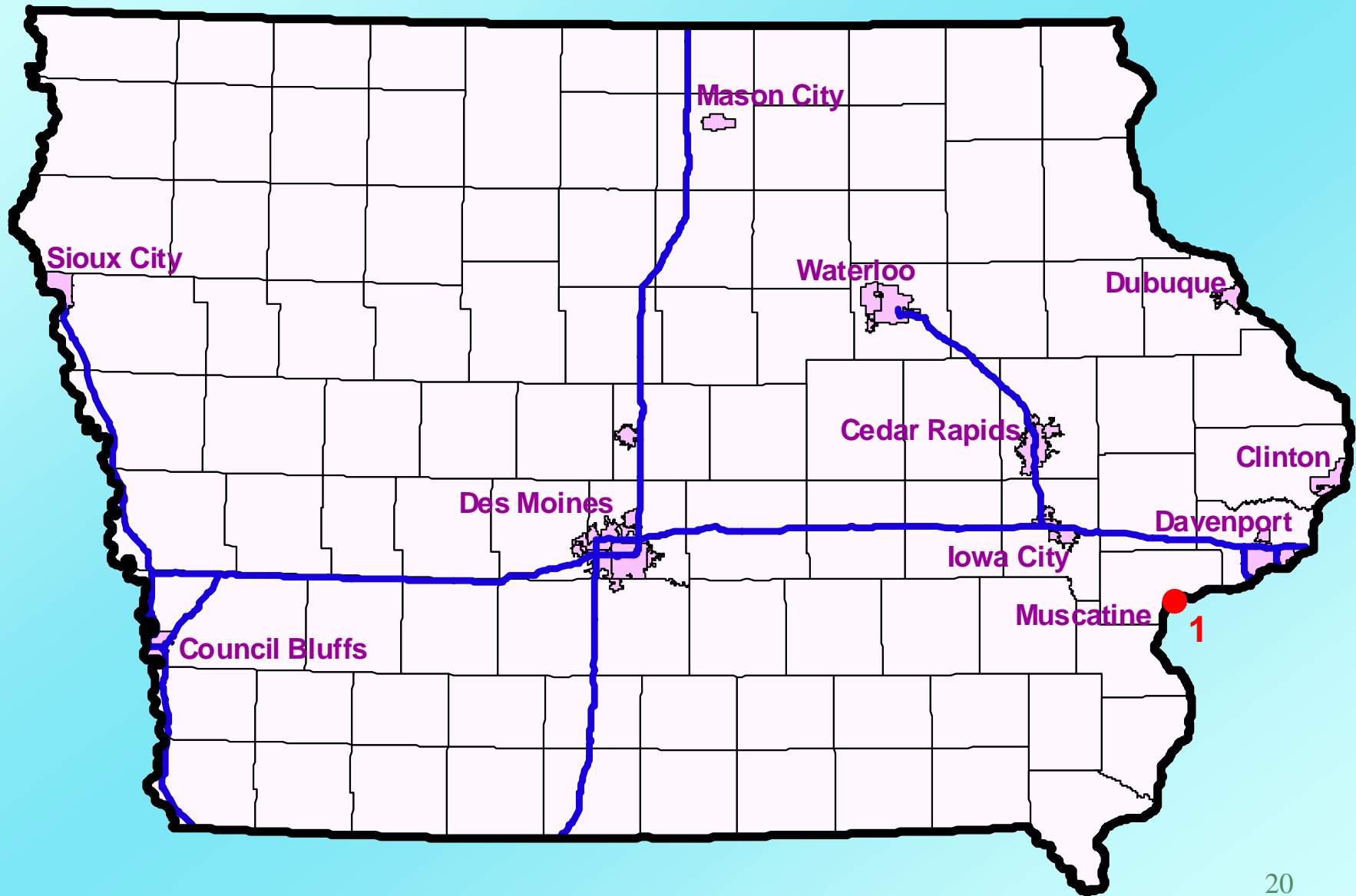
# PM2.5 AQI Exceedances in Iowa 1999-2005



# PM10 AQI Exceedances in Iowa 1999-2005



# SO2 AQI Exceedance 1999-2005



# Web Resources

## Real-time AQI reporting :

*In Polk County:*

<http://www.airquality.co.polk.ia.us/>

*In Linn County:*

<http://www.air.linn.ia.us/>

*Outside Polk and Linn Counties:*

<http://www.uhl.uiowa.edu/services/environment/airquality/ambient/index.html>

*Ozone Maps:*

<http://www.epa.gov/airnow/index.html>

## Historical AQI values for Iowa and Other States:

<http://www.epa.gov/air/data/>